



## **Module Specification**

### **Flight**

Version: 2022-23, v5.0, 31 May 2022

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## Part 1: Information

**Module title:** Flight

**Module code:** UFMFFK-15-2

**Level:** Level 5

**For implementation from:** 2022-23

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**Faculty:** Faculty of Environment & Technology

**Department:** FET Dept of Engineering Design & Mathematics

**Partner institutions:** University Centre Weston

**Delivery locations:** Frenchay Campus, University Centre Weston

**Field:** Engineering, Design and Mathematics

**Module type:** Standard

**Pre-requisites:** Dynamics Modelling and Simulation 2021-22

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** This module provides a detailed overview of flight mechanics and dynamics concepts using illustrated practical examples and computational exercises to help reinforce concepts of aircraft performance and stability. Students will also have the opportunity to undertake a flight test course in a real aircraft as well as use flight test data to model aircraft dynamic motion.

**Features:** Not applicable

**Educational aims:** Introduce students to the fundamentals of flight performance and stability

**Outline syllabus:** The module aims to introduce students to the mechanics and stability of flight. The student will be exposed to a number of aspects.

Elements of aircraft performance will be covered including trim, take-off and landing, climb, descent, and level flight.

Principles of aircraft longitudinal and lateral static stability will be covered including weight and balance, neutral point, static margin, effect of elevators including elevator angle to trim and stick force gradients, and stick-fixed versus stick-free static stability.

Principles of aircraft longitudinal and lateral dynamic stability covered including mathematical description, analytical solutions to, and numerical simulations of the primary dynamic modes of an aircraft.

Principles of flight test will be covered including in-flight measurements; post-flight calculations; comparison with theory and flight test.

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** The skills acquired by the student are demonstrated within a project based framework. A typical project may for instance be the conceptual design of an aircraft. The students are led through the conceptual design by the teaching team upon which the students can then apply the concepts and taught materials. They will then demonstrate their conformance to the learning outcomes in a portfolio of assessments.

**Module Learning outcomes:** On successful completion of this module students will achieve the following learning outcomes.

**MO1** Apply concepts and principles in flight theory to model performance, and to static and dynamic stability of aircraft(SM1b, EA1b, EA2)

**MO2** Recognise flight test data collection methods (P8)

**MO3** Apply fundamental flight test data processing principles to an aircraft (SM1b, SM2b, P8)

**MO4** Use analytical and numerical models to assess the aircraft dynamic flight modes (SM1b, EA1b, EA2, P8)

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 113 hours

Face-to-face learning = 12 hours

Total = 150

**Reading list:** The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link <https://rl.talis.com/3/uwe/lists/0EF1C44C-BBCD-7D1A-66EA-79D8EE2E3487.html?draft=1&lang=en-GB&login=1>

## Part 4: Assessment

**Assessment strategy:** Component A:

Control conditions assessments (oral examinations up to 30min), designed to encourage timely engagement with the material and consolidate their understanding of theoretical principles, using aircraft as case-studies (70%).

Component B:

A portfolio (three or more) of evenly scheduled individual assessments (e.g. DEWIS tests) framework. (30%)

The professional body requirement for exposure to flight test measurement methods are performed in this component by attendance of a laboratory and completion of the associate lab report. (Pass/Fail)

The resit assessment will replicate the first sit for both components.

**Assessment components:**

**Presentation - Component A (First Sit)**

Description: Oral examination (30minutes per student)

Weighting: 70 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO3, MO4

**Portfolio - Component B (First Sit)**

Description: Portfolio of assessments primarily in the form of online tests

Weighting: 30 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO3

**Laboratory Report - Component B (First Sit)**

Description: Exposure to flight test measurement methods measured by laboratory attendance (pass/fail).

Weighting: 0 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2

**Presentation - Component A (Resit)**

Description: Oral examination (30minutes per student)

Weighting: 70 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO3, MO4

**Portfolio - Component B (Resit)**

Description: Portfolio of assessments primarily in the form of online tests

Weighting: 30 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO3

**Laboratory Report - Component B (Resit)**

Description: Exposure to flight test measurement methods measured by laboratory attendance(pass/fail).

Weighting: 0 %

Final assessment: No

Group work: No

Learning outcomes tested: MO2

**Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Aerospace Engineering {Apprenticeship-UCW} [Sep][FT][UCW][4yrs] BEng (Hons)  
2021-22

Aerospace Engineering {Apprenticeship-UCW} [Sep][FT][UCW][5yrs] BEng (Hons)  
2021-22

Aerospace Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2021-22

Aerospace Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2021-22

Aerospace Engineering [Sep][FT][Frenchay][4yrs] MEng 2021-22

Aerospace Engineering [Sep][SW][Frenchay][5yrs] MEng 2021-22

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][5yrs] MEng 2021-22

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][4yrs] MEng 2021-22

Aerospace Engineering with Pilot Studies [Sep][FT][Frenchay][3yrs] BEng (Hons)  
2021-22

Aerospace Engineering with Pilot Studies [Sep][SW][Frenchay][4yrs] BEng (Hons)  
2021-22

Aerospace Engineering {Apprenticeship-UWE} [Sep][FT][UCW][4yrs] BEng (Hons)  
2021-22

Aerospace Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2020-  
21

Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2020-  
21

Aerospace Engineering with Pilot Studies {Foundation} [Sep][FT][Frenchay][4yrs]  
BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs]  
BEng (Hons) 2020-21

Aerospace Engineering Manufacturing [Sep][PT][UCW][3yrs] FdSc 2020-21

Aerospace Engineering {Foundation} [Sep][FT][Frenchay][4yrs] - Not Running BEng  
(Hons) 2020-21

Aerospace Engineering (Manufacturing) {Foundation} [Sep][SW][Frenchay][5yrs] -  
Not Running BEng (Hons) 2020-21

Aerospace Engineering (Manufacturing) {Foundation} [Sep][FT][Frenchay][4yrs] -  
Not Running BEng (Hons) 2020-21

Aerospace Engineering (Design) {Foundation} [Sep][SW][Frenchay][5yrs] - Not  
Running BEng (Hons) 2020-21

Aerospace Engineering (Systems) {Foundation} [Sep][FT][Frenchay][4yrs] - Not  
Running BEng (Hons) 2020-21

Aerospace Engineering (Design) {Foundation} [Sep][FT][Frenchay][4yrs] - Not  
Running BEng (Hons) 2020-21

Aerospace Engineering (Systems) {Foundation} [Sep][SW][Frenchay][5yrs] - Not  
Running BEng (Hons) 2020-21

Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] - Not Running BEng (Hons) 2020-21

Aerospace Engineering (Manufacturing) {Apprenticeship-UCW} [Sep][FT][UCW][5yrs] - Not Running BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies {Foundation} [Sep][FT][Frenchay][4yrs] - Not Running BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies (Systems) {Foundation} [Sep][SW][Frenchay][5yrs] - Not Running BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies (Systems) {Foundation} [Sep][FT][Frenchay][4yrs] - Not Running BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies (Manufacturing) {Foundation} [Sep][SW][Frenchay][5yrs] - Not Running BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies (Design) {Foundation} [Sep][SW][Frenchay][5yrs] - Not Running BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies (Manufacturing) {Foundation} [Sep][FT][Frenchay][4yrs] - Not Running BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs] - Not Running BEng (Hons) 2020-21

Aerospace Engineering with Pilot Studies (Design) {Foundation} [Sep][FT][Frenchay][4yrs] - Not Running BEng (Hons) 2020-21

Aerospace Engineering [Sep][PT][UCW][8yrs] MEng 2019-20

Aerospace Engineering [Sep][PT][Frenchay][8yrs] MEng 2019-20

Aerospace Engineering with Pilot Studies (Design) [Sep][PT][Frenchay][6yrs] BEng (Hons) 2019-20

Aerospace Engineering with Pilot Studies [Sep][PT][Frenchay][6yrs] BEng (Hons) 2019-20

Aerospace Engineering with Pilot Studies (Manufacturing) [Sep][PT][Frenchay][6yrs] BEng (Hons) 2019-20



Aerospace Engineering with Pilot Studies (Systems) [Sep][PT][Frenchay][6yrs] BEng (Hons) 2019-20

Aerospace Engineering (Design) [Sep][PT][Frenchay][8yrs] MEng 2019-20

Aerospace Engineering (Manufacturing) [Sep][PT][Frenchay][8yrs] MEng 2019-20

Aerospace Engineering (Systems) [Sep][PT][Frenchay][8yrs] MEng 2019-20